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EFFECT OF PHYTOCHEMICAL COMPONENTS IN GASTROINTESTINAL TRACT

Ernazarova Shohista
Assistant-Teacher, Karshi State University
Email-shoxistaernazarova494@gmail.com, phone-914500069

Ikromova Muxlisa
Assistant-Teacher, Karshi State University
Email- muxlisaikromova70@gmail.com

Abstract
Phytochemicals are found in plants in the human diet and may have beneficial (or harmful) effects on health and include flavonoids, glucosinolates, organosulfur compounds, saponins, monoterpenes, sesquiterpenes, capsaicinoids, and capsinoids. takes It affects the gastrointestinal system in different ways.

Keywords: plant foods, phytochemicals, gut microbiota, degestive prossses, health

Introduction

Since ancient times, plants, animals natural products have been used in medicine to treat diseases. Human use of plants as medicine may have begun at least 60,000 years ago. Over the past decade, more attention has been paid to the effects of medicinal plants. Traditional grasses from different habitats and geographic locations can be seen as a new strategy for wound healing and protection against infections.

Phytochemicals include prebiotics and probiotics, as well as several chemical compounds such as polyphenols, carotenoids, and thiosulfates. Their largest group contains polyphenols, which can be divided into four main groups: flavonoids (including eight subgroups), phenolic acids (such as curcumin), stilbenoids (such as resveratrol), and lignans. The human gastrointestinal tract is a complex microbial ecosystem known as the intestinal microbiota. The microbiota is involved in several important physiological processes, such as digestion, absorption and related physiological functions, and plays a decisive role in determining the health of the host. The usual consumption of certain dietary components can affect them in addition to their nutritional benefits, change the variety and function of intestinal microbiota and control health. Phytochemicals are non-nutrient biologically active components of the plant that can alter the composition of the intestinal microflora by selectively stimulating or inhibiting the proliferation of microorganisms in the intestine. These compounds are difficult to absorb due to their low bioavailability and prolonged storage in the intestine, which has a beneficial effect on the intestinal microbiota population. Feeding containing phytochemicals for humans and animals can offer a way to improve the gut microbiome, resulting in improved performance and/or health and well-being. From the literature, we found that the influence of phytochemicals on the modulation of the intestinal microbiota environment and, consequently, the benefits for humans were revealed; however, the effect of phytochemicals on the intestinal microbiota of animals is also briefly covered. Phytochemicals are non-nutrient plant compounds that are biologically active and formed by primary and secondary metabolism of plants. Phytochemicals are natural functional ingredients

common in fruits, vegetables, seeds and nuts, whole grains, legumes, dark chocolate and tea, and their regular diet has been recommended to reduce the occurrence of many chronic diseases. Relatively few phytochemicals have been identified and isolated from plants, but there are tens of thousands of phytochemicals. Phytochemicals benefit the human and animal organism by selectively stimulating the reproduction of certain bacterial populations in the intestine, called "probiotics", by altering the intestinal microflora. They consist of endosymbionts, including yeast, Bifidobacteria, lactic acid bacteria, and rods involved in human and animal GI metabolism. Phytochemicals can be divided by biosynthetic origin into polyphenols, alkaloids, terpenoids (carotenoid terpenoids and non-carotenoid terpenoids), sulfur organogygamonic compounds, and nitrogen-containing compounds. Among these phytochemicals, polyphenols form the largest group. It has been proven to reduce inflammation of phytochemicals, slow down the growth rates of cancer cells, reduce the formation of carcinogenic compounds, regulate gene expression and intracellular signaling of hormones, strengthen the immune system, soften DNA damage, reduce oxidation while activating cells and insulin receptors[1,2] .

Methods

A review of research by some scientists found that pomegranate extract in the intestine contributes to the growth of Enterococcus, Bifidobacterium and Lactobacillus. Some other research scientists have conducted research using the in vivo model to study the effects of tannic acid on communities of cultural organisms. In rats, it has been found that tannic acid can alter the ecological balance of the gut microbiota. This study proved the toxic and anti-nourishing properties of tannic acid, showing large microbial growth and reduced body weight in experimental animals after the addition of tannic acid for 21 days. In contrast, Enterobacteriaceae and Prevotella, Bacteroides have increased porphyromonae in rat specimens.

In general, dietary phytochemicals (polyphenols) are taken as xenobiotics in people who have been consumed once. Their absorption and bioavailability in the small intestine is relatively low due to their structural complexity and polymerization. Many studies have shown that dietary phytochemicals are part of the intestinal ecosystem, and that their metabolites can function as harmful intestinal microbiota prebiotics as well as antimicrobial agents, usefully altering the composition of Microbial Ecology. Determination of the influence of phytochemicals on the growth, reproduction and metabolism of bacteria on the structure of phytochemicals, type of microbial strain and dosage level. For example, gram-negative bacteria have greater resistance to phytochemicals that may be due to changes in their composition than gram-positive bacteria. Phytochemicals can alter the functions of bacterial cell membranes and thus slow down cell growth.

Ruminants (cattle, sheep, goats, alpacas, reindeer, etc. It cannot directly digest plant material due to a lack of enzymes capable of breaking down cell walls (cellulose and hemicellulose). On the contrary, a large number of bacteria, protozoa and animals live in the digestive system of ruminants. Fungi are able to digest a diet with a large proportion (80-85%) of high fiber plant material in a four-chamber stomach (stomach, net, omasum and abomasum), while monogastric animals consume less (15-20%). The characteristics of the small intestine of anatomical and functional ruminants are similar to those of ruminants, but the length is about 12-30 times the length of the animal's body. The microbial community (bacteria, protozoa, archaea, fungi and bacteriophages) is responsible for fermenting complex plant materials consumed by rumen ruminants[1,2,3].

Results

Basically, polyphenols are antioxidants for the body and protect against ultraviolet light and poisoning. At the same time, it is also useful for cancer and heart diseases. The stomach is also good for the intestines. Polyphenols are abundant prooxidants and sometimes exhibit anti-metabolic activity. They may also work against apoptosis. They can increase the amount, reduce the enzymes lypoxygenase and telomerase. Hydroxycinnamic and hydroxybenzene acids are 2 classes of phenolic acids. Hydroxybenzoic acid may not play a role in the human body. Some phenolic acids are found free in vegetables and some are bound. And bound phenolic acids appear without acid, enzyme, hydrolysis. 270mg/kg is found in the fruit of red berries. The fruit of Physalis angulate is also a berry.

Polyphenols, including flavonoids (rutin, mangiferin, and kaempferol) and phenolic acids (gallic, caffeine, and ellagic acid), have been identified in Physalis angulata using several methods.

The structure of flavanoids consists of 2 benzene rings connected to a ring with 3 carbon chains. 4000 types of flavanones are found in plants. They are joined to C3 and C2 by a double bond and to C3 by an H bond. The bark of plants is very rich in flavanols. Because they will be enriched with sunlight. Flavanols can be in mono and poly molecular form. The combination of flavones is held by C4 and O2 molecules. They are saturated with 3 carbons.

Bioactivity of phytochemical compounds

The intestinal absorption of polyphenols depends mainly on their chemical structure. As an example, catechin is a phenolic compound with high bioactivity and has been detected in plasma and urine. Polyphenols pass through the small intestine unabsorbed. Because intestinal microbiome will be there.

Tannins: Complex compounds are also classified as phenolic compounds. They have a larger molecular mass than protein, cellulose, starch. Soluble in water. They contain gelatin, alkaloids, protein precipitation. Tannins are secondary metabolites. Tannin is used in diarrhea and skin burns. Food products containing tannin are low in calories. Some tannin compounds are active against mutagens. Physalis angulata also contains tannin. Their slightly bitter taste indicates the presence of tannin. Tannins have antioxidant activity and protect cells from lipid peroxidase and oxidative stress. Fungus, yeast, bacteria, viruses stop their activity due to tannins. Propyl gallate cleans food and water bacteria. Tannins lower blood pressure and slow down the formation of blood clots. Lowers plasma fat level, reduces liver damage.

Saponins: Triterpene glucosides produce a foam when mixed with bitter-tasting, poisonous water. They are widely used in soap making, medicine, fire extinguishing, production of feed additives, production of carbonated water. They are soluble in both water and fat[1, 2,3,4] .

Discussion

The review shows that phytochemicals play a decisive role in improving human (and animal) health, in particular intestinal health, ensuring an abundance of useful substances. Suppresses bacteria and protozoa and harmful bacteria, exhibits prebiotic activity. the bioactivity and metabolic function of certain phytochemicals in the body has been investigated so far. For this reason, further research should focus on studying the therapeutic potential of the rest phytochemicals and explaining the complex mechanisms and determining which phytochemical affects which microorganism when modulating the intestinal microbiota is necessary. In addition, the interaction of dietary phytochemicals with the microbiome and other nutrients such as minerals, vitamins and essential fatty acids in fermentation,

digestion, bioavailability of nutrients in the intestine and their effects in vivo using studies to maintain the health of people and animals is even more guaranteed research. Since human trials and animal model studies have not been conducted sufficiently, there is another challenge that the use of these natural phytochemicals in the pharmaceutical industry for the production of drugs is aimed at improving intestinal health. In the future, more animal model studies and human tests should be carried out only with the help of phytochemicals to open the way for the development of drugs or diets that contain phytochemicals and other nutrients such as vitamins, essential oils acids, etc.

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